



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,780	07/24/2003	Uhlig Albrecht	6161.0072.AA	8190

7590 11/01/2004

McGuireWoods LLP
Tysons Corner
1750 Tysons Boulevard, Suite 1800
McLean, VA 22102-4215

EXAMINER

GARRETT, DAWN L

ART UNIT	PAPER NUMBER
----------	--------------

1774

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,780

Applicant(s)

ALBRECHT ET AL.

Examiner

Dawn Garrett

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☒ Claim(s) 27-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7-24-03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 5 and 17 are objected to because of the following informalities: It is suggested “includes” be changed to “is selected from the group consisting of” in claim 5 for clarity, because only a singular “polymer” is recited and polyphenylenevinylenes and polyfluorenes are two different types of polymers. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 5, 8-11, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (US 5,652,067). Ito et al. disclose an organic electroluminescent device comprising a substrate (1), an OEL layer (4) per the instant “emissive layer, an EITL layer (12) per the instant “electron injecting layer”, a cathode layer (5) per the instant “electrical conducting layer”, and a conducting layer (7) per the instant “cathode contact layer” which contacts the cathode layer (5) but does not contact the EITL layer (12) (see Figure 2). Polymers such as poly(2,5-diheptyloxy-p-phenylenevinylene), which is considered to be a polyphenylenevinylene per claims 4 and 5, comprise the light emitting layer (OEL) (see col. 17, lines 1-2). A hole injecting layer (3) and an emissive layer (4) are included in the Ito et al. device per claim 8 (see Figure 2).

The cathode layer (5) per the instant “electrical conducting layer” is comprised of aluminum or silver (see col. 18, lines 45-47). The Ito et al. anode is formed of indium tin oxide (ITO) per claim 11 (see col. 7, lines 20-25). Per claim 9, NPB recited in claim 9 is taught within formula (8) for the HITL (3) of the Ito et al. device (see col. 12, lines 1-17). The compound Alq3 is disclosed by Ito et al. as a preferred OEL material per claim 9 (see Example 1, lines 39-41).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13, 14, 16, 17, 20- 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 5,652,067). Ito et al. discloses an organic electroluminescent device comprising a substrate (1), an OEL layer (4) per the instant “emissive layer, a cathode layer (5) per the instant “electrical conducting layer”, a conducting layer (7) per the instant “cathode contact layer”, and a hard-corrosive metal layer (15) which reads upon the “connecting layer” that directly contacts the conducting layer (cathode contact layer) and the cathode layer (5) (the electrical conducting layer) (see Figure 10). Although not expressly shown in a preferred embodiment or drawing in the Ito et al. patent, the device may further include an EITL layer (12) per the instant “electron injecting layer” as shown in Figures 2 and 9 to enable electrons to be efficiently transported from the cathode (5) to the OEL (4) (see col. 17, lines 60-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to

have included an EITL layer in the device depicted in Figure 10 in order to improve electron transport from the cathode to the OEL, because Ito et al. clearly teaches an EITL layer for providing this improvement. The hard-corrosive metal layer (15) may be comprised of copper or gold per claim 14 (see col. 19, lines 15-17). Polymers such as poly(2,5-diheptyloxy-p-phenylenevinylene), which is considered to be a polyphenylenevinylene per claims 16 and 17, comprise the light emitting layer (OEL) (see col. 17, lines 1-2). A hole injecting layer (3) and an emissive layer (4) are included in the Ito et al. device per claim 20 (see Figure 2). The cathode layer (5) per the “electrical conducting layer” is comprised of aluminum or silver (see col. 18, lines 45-47) per claim 22. The Ito et al. anode is formed of indium tin oxide (ITO) per claim 23 (see col. 7, lines 20-25). Per claim 21, NPB recited in claim 21 is taught within formula (8) for the HITL (3) of the Ito et al. device (see col. 12, lines 1-17). The compound Alq3 is disclosed by Ito et al. as a preferred OEL material per claim 21 (see Example 1, lines 39-41).

6. Claims 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 5,652,067) in view of Kaneko et al. (JP 09-082476). Ito et al. (US 5, 652,067) is relied upon as set forth above for the rejection of claims 1 and 13. Ito et al. discloses a conducting layer (7) per the “cathode contact layer” (see figures 2, 9 and 10); however, Ito et al. fails to describe specifically a material that comprises the conducting layer (7). Ito et al. states the conductive layer (7) “may have the same construction as those of conventional EL devices” (see col. 19, line 66 to col. 20, line 2). Kaneko et al. teaches an organic electroluminescent device that comprises an input terminal 12B that is analogous to the claimed “cathode contact layer” (see abstract and Figures). The input terminal 12B as well as the anode electrode 12A are comprised of indium tin oxide (ITO) (see paragraph 11). It would have been obvious to one of ordinary skill in the art at

Art Unit: 1774

the time of the invention to have formed the Ito et al. conducting layer (7) from indium tin oxide (ITO), because Kaneko et al. teaches ITO as a conventional material for the component used in an organic electroluminescent device.

7. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 5,652,067) in view of Utsugi et al. (US 5,837,391). While Ito et al. teaches an EITL (electron injecting transporting layer) (12) for the organic electroluminescent device per the “electron injecting layer” which may comprise an oxadiazole derivative (see col. 18, lines 1-2), Ito et al. fails to teach the electron injecting layer is comprised of at least one of lithium fluoride, barium, barium oxide, and calcium oxide. Utsugi et al. teaches in analogous art the use of either oxadiazole derivatives, barium oxide, or calcium oxide as an electron injecting layer (see col. 10, lines 51-64). It would have been obvious to one of ordinary skill in the art at the time of the invention to have used calcium oxide or barium oxide in place of an oxadiazole derivative in the Ito et al. device, because Utsugi et al. teaches the equivalency of these materials as electron injecting materials for an electroluminescent device electron injecting layer.

8. Claims 6, 7, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US 5,652,067) in view of Liao et al. (US 2003/0170491). Ito et al. teaches an OEL layer (4) and a hole injecting-transporting layer (3) as part of an organic electroluminescent device. Polymers such as poly(2,5-diheptyloxy-p-phenylenevinylene), which is considered to be a para-phenylenevinylene, comprise the light emitting layer (OEL) (see col. 17, lines 1-2). Ito et al. fail to teach the hole injecting layer is comprised of polyethylene-dioxythiophene (PEDOT). Liao et al. teaches, in analogous art, the use of a PEDOT containing hole transporting layer in conjunction with a PPV luminescent layer in an organic electroluminescent device (see par. 186).

It would have been obvious to one of ordinary skill in the art to have selected PEDOT as the material for the HITL layer, because Liao et al. teaches PEDOT works as a hole transporting material when adjacent to a PPV light emitting layer in an organic electroluminescent device. (The examiner notes that applicant's definition of an emissive layer includes an embodiment wherein the emissive layer comprises two layers).

Allowable Subject Matter

9. Claims 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art is considered to be Ito et al., discussed herein, which teaches an organic electroluminescent device comprising a cathode contact layer. Ito et al. fails to teach the specific method of shadow mask in order to form layers of the device.

Conclusion


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571)272-1523. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Application/Control Number: 10/625,780
Art Unit: 1774

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Dawn Garrett
Primary Examiner
Art Unit 1774

D.G.
October 27, 2004